

CLAIMS

1. A communications network comprising:

a pair of network elements;

two or more working spans coupled between said pair of network

elements for carrying communications traffic between said pair of network elements, each working span carrying said communications traffic over a

plurality of channels associated with one or more rings;

a shared protection span coupled between said network elements, said

shared protection span providing a plurality of channels in excess of the number of channels of one or more of the working spans;

wherein said network elements include circuitry for concurrently switching communication traffic on rings associated with different working spans to respective channels of said shared protection span.

2. The communications network of claim 1 wherein shared protection span provides a plurality of channels in excess of the number of channels of any of the one or more working spans.

3. The communications network of claim 1 wherein at least one of said working spans carries traffic for multiple ring structures.

4. The communications network of claim 1 wherein said pair of network elements each includes a non-blocking optical matrix.

5. The communications network of claim 4 wherein each of said pair of network elements is coupled to two or more incoming working spans and two or more corresponding incoming protection spans.

6. The communications network of claim 5 wherein each of said pair of network elements includes control circuitry for switching a channel from each

of said incoming protection spans to an available channel of said shared protection span.

7. The communications network of claim 6 wherein said control circuitry further is operable to switch a channel from each of said incoming working spans to said shared protection span.

8. The communications network of claim 5 wherein each of said pair of network elements includes control circuitry for switching a channel from said shared protection span to a channel on an outgoing protection span.

9. A network element comprising:
interface circuitry for coupling to two or more incoming working spans and two or more respective incoming protection spans, each of said working spans operable to carry communications traffic over a plurality of channels associated with one or more rings; and
switching circuitry for concurrently coupling channels from different incoming protection spans to a shared protection span, said shared protection span providing a plurality of channels in excess of the number of channels of one or more of the working spans.

10. The communications network of claim 1 wherein shared protection span provides a plurality of channels in excess of the number of channels of any of the one or more working spans.

11. The network element of claim 9 wherein said switching circuitry includes control circuitry for selective switching a channel from an incoming protection span to an available channel on said shared protection span responsive to control information.

12. The network element of claim 11 wherein said switching circuitry further includes a non-blocking optical matrix.

13. The network element of claim 9 wherein said interface circuitry
2 includes a channel demultiplexer.

14. The network element of claim 13 wherein said interface circuitry
2 further includes a channel multiplexer.

15. The network element of claim 14 wherein said interface circuitry
2 includes input/output shelves coupled to said demultiplexer and said
multiplexer.